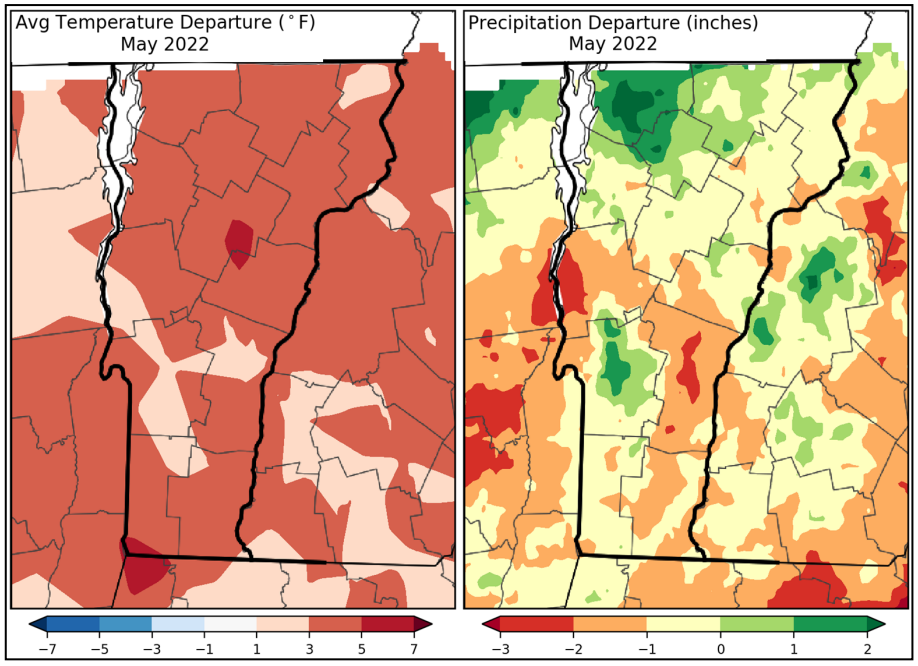
Vermont Forest Health

Insect and Disease Observations — May 2022

Department of Forests, Parks & Recreation
May 2022 vtforest.com

May Weather

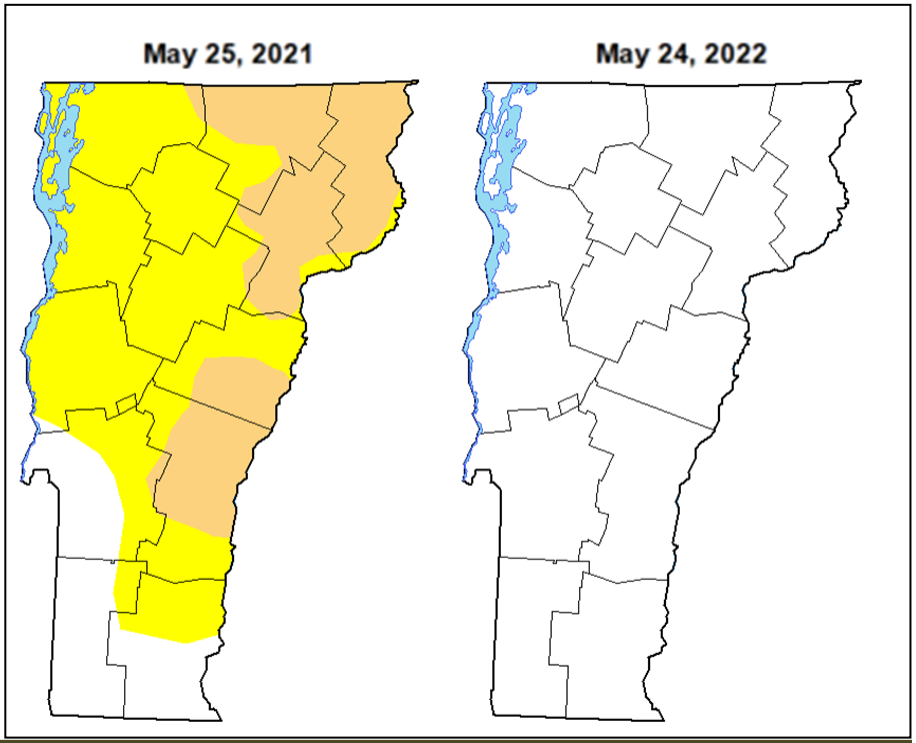
The end of May marks the last full month of spring. On average, this month was warmer and wetter than May of 2021. State-wide temperatures averaged 56.4 °F, which was 2.9 degrees warmer than May of last year. Statewide precipitation averaged 3.18 inches, which was 0.6 inches more than May of last year.



Average temperature and precipitation departure from normal. Maps and data: Northeast Regional Climate Center.

Drought Update

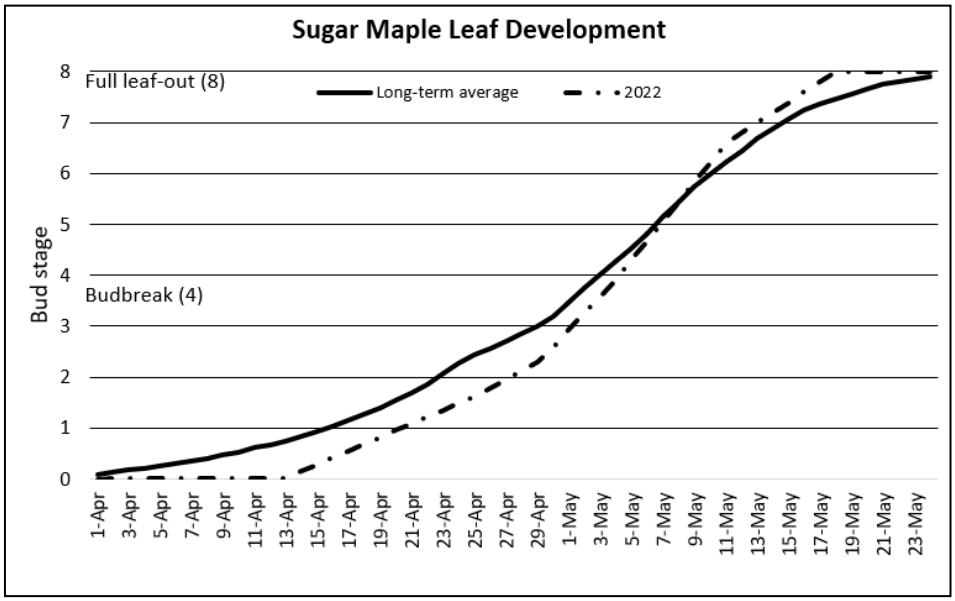
Spring rainfall continued to lessen drought severity throughout the state. On May 24th, the U.S. Drought Monitor listed 100% of the state as no drought. Compared to this time last year on May 25th, 2021, 28.35% of the state was listed in moderate drought, 55.14% as abnormally dry, and 16.51% as no drought.



Drought comparison between May 2021 and 2022. Map and data: U.S. Drought Monitor.

Spring Budbreak and Leaf Out

Sugar maple trees at our long-term phenology monitoring site in Underhill, VT broke bud on May 5, 2022. This was very close to the long-term average for budbreak at the site (May 3), and nearly a month later than the very early budbreak in 2021 (April 12). Despite the difference in timing of budbreak between this year and last, full leaf out was observed at the site on May 16, 2022 - one day later than 2021 and two days earlier than the long-term average.



Spongy Moth Update

The spongy moth (*Lymantria dispar dispar*) is entering year two of a predicted three to five year outbreak in Vermont. Spongy moth caterpillars were reported emerging from egg masses in early April, and have begun feeding in groups on expanding leaves. These young caterpillars will spread by "ballooning" from long threads, which break in the wind and carry caterpillars to a new location. As they grow, they molt 5-6 times, increasing in size and appetite.

There are several control methods that can be used if you have high value trees. This includes:

Mechanical Control:

- Caterpillars can be squished, or pruned out of the trees and submerged in soapy water.
- Installing a band of burlap around the bole of the tree this year will encourage egg masses to be laid on the burlap this fall. After the eggs are laid, you can remove the burlap and destroy the egg masses. This can help reduce the population next year.
- Sticky bands (or duct tape) can also be installed this year on the trunk and/or lower branches of high-value trees. When caterpillars crawl up the trunk, they will get stuck and die. If you use this method, a piece of chicken wire or plastic covering should also be used to prevent wildlife such as birds or small mammals from getting stuck on the bands.

Chemical Control: The most recommended pesticide treatments contain the bacteria, *Bacillus thuringiensis kurstak* (Btk). Btk is applied to foliage where spongy moth larvae will consume it and are then killed. This strain of bacteria is specific to moth larvae, and its toxic properties get activated when it interacts with enzymes in the caterpillar's digestive tract. This pesticide works best when it is applied to the foliage before the caterpillars are an inch in size.

Supplemental Sightings

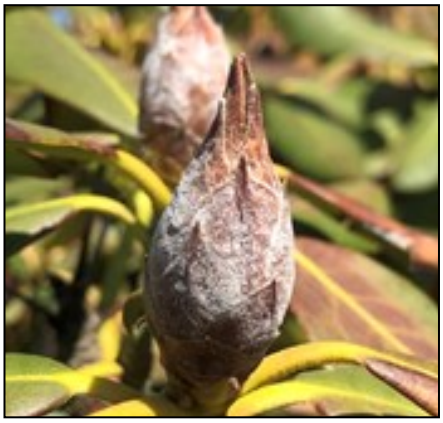
Eastern tent caterpillar (ETC, *Malacosoma americanum*) tents were observed in southern Vermont. This native defoliator prefers to feed on cherry (*Prunus* spp.) and apple (*Malus* spp.) although it can also be observed on other hardwoods. In early March, ETC hatch from overwintered eggs and spin a silken tent in the crotch of a preferred host. During early morning and early evening, ETC will emerge to feed and retreat into the tent during the day and night to avoid predators and severe weather.

Eastern tent caterpillar nest. Photo credit: FPR Staff.

Pear thrips (*Taeniothrips inconsequens*) damage was observed on sugar maples (*Acer saccharum*) throughout the state after leaf emergence. Heavy pear thrips damage causes leaves to be dwarfed, mottled yellow to brown, and distorted. This can lead to a thin canopy in infested trees and can result in premature leaf drop.

Pear thrips damage. Photo credit: FPR

Rhododendron bud blast (causal agent *Pycnostysanus azalea*) was observed on urban rhododendrons in Georgia, VT. This fungus causes flower buds to turn brown and die before blooming. This fungal pathogen is sometimes found in association with the red-banded leafhopper (*Graphocephala coccinea*), although more research is needed to determine if it is a vector of this pathogen.



Rhododendron bud blast damage. Photo credit: FPR Staff.

Pine bark adelgid (*Pineus strobi*) was observed on eastern white pine (*Pinus strobus*) in the Northeast Kingdom. During spring the immature females that were overwintering mature and begin to produce a coating of wooly wax on buds, needle bases, and bark crevices. This waxy cover creates a sheltered egg-laying site that is used to protect eggs from predators and weather. After hatching, pine bark adelgids will feed on needles, causing chlorosis. In smaller trees, this feeding can cause infested trees to be stunted or killed but are less detrimental to older trees.

Pine bark adelgid. Photo credit: Petr Kapitola, Central Institute for Supervising and Testing in Agriculture, Bugwood.

Maple anthracnose (causal agents *Aureobasidium apocryptum, Discula campestris* and *Colletotrichum gleosporioides*) have been observed causing leaf necrosis on sugar maple (*Acer saccharum*) after periods of heavy rainfall. These pathogens cause necrosis on main veins and margins of leaves. In severe infections, this foliar pathogen can cause premature leaf drop, but since it is usually more prevalent in spring, trees can typically refoliate during the growing season.

Maple anthracnose. Photo credit: FPR Staff.

Brown marmorated stink bug (BMSB, *Halyomorpha halys*) continue to be reported in homes this spring. This insect is invasive and can be a serious pest to over 100 host plants in agricultural settings and natural communities, however, its effect in VT is still unknown. BMSB does not sting or bite humans, and instead uses scent glands as self defense.

BMSB adult. Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.

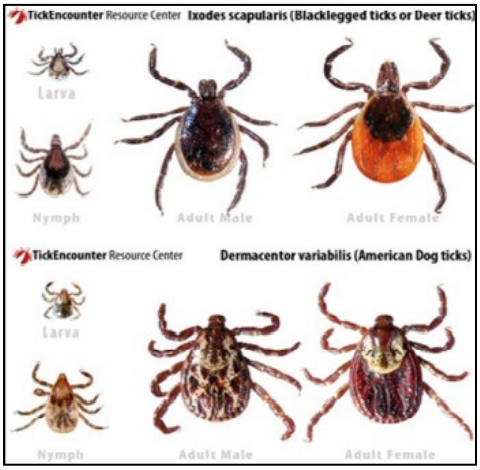
Black knot is caused by the native fungus *Apiosporina morbosa,* and continues to be reported at low levels throughout the state. This pathogen infects stone fruit species in the *Prunus* genus. Infected trees develop stem galls that grow and girdle branches. This pathogen overwinters in the galls, and reinfects the same tree and neighboring trees in the spring. When possible, galls should be pruned out of the tree 3-4 inches below infected tissue and pruners should be sanitized between each cut to prevent its spread.

Multiple black knot galls. Photo credit: FPR Staff.

Armillaria root rot (*Armillaria* spp.) continues to be reported at low levels across this state. This genus of fungi is both a parasite and saprotroph and can infect numerous hardwood and softwood species. In its parasitic stage, this pathogen causes reduced growth, smaller needles or leaves, yellowing of needles or leaves, and dieback and mortality of infected hosts. Although damaging, this pathogen is considered to be a contributing factor of decline and mortality, not the causal agent.

Armillaria rhizomorphs. Photo credit: FPR Staff.

Blacklegged (deer) ticks (*Ixodes scapularis*) and American dog ticks (*Dermacentor variabilis*) continue to be reported across the state. Ticks are more commonly found in wooded and grassy habitats, however, they can also be prevalent in urban and coastal areas. For more information about ticks in Vermont, check out the VT Department of Health and the VT Agency of Agriculture, Food & Markets websites.



Life stages of black-legged ticks (top) and American dog ticks (bottom). Photo credit: University of Rhode Island.

White spotted sawyer (*Monochamus scutellatus*) are a native wood-boring beetle that have been reported in southern Vermont. These beetles attack a variety of dead or dying conifers and are therefore considered a secondary pest to eastern softwood forests. As larvae, this insect bores into the wood, contributing to girdling and dieback in living infested trees. As adults, these dull brown beetles feed on the bark and undersides of branches.

White spotted sawyer adult. Photo credit: William M. Ciesla, Forest Health Management International, Bugwood.

Frost cracks were reported on an apple tree (*Malus* sp.) in Franklin county. Frost cracks are vertical cracks that occur on branches and the main bole of trees when temperatures dip below freezing and the tree is unable to endure the water expansion inside. This damage is common when there are large temperature fluctuations such as when a tree is receiving direct winter sunlight that causes the water inside the tree to prematurely thaw, and then refreezes when the sun goes down.

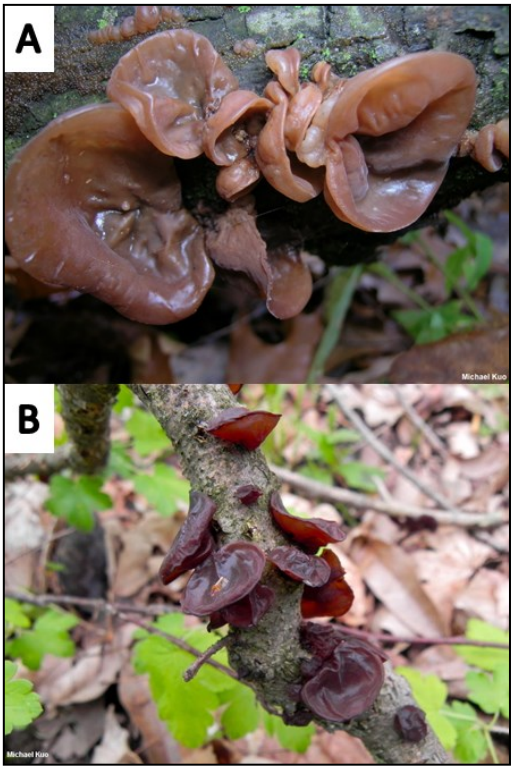
Frost crack. Photo credit: FPR Staff.

Pink lady slippers (*Cypripedium acaule*) have started blooming in southern Vermont this month. This wildflower belongs to the orchid family and has a symbiotic relationship with fungi in the *Rhizoctonia* genus. Unlike most plants, pink lady slippers do not have nutrient storage inside of seeds. In this symbiotic relationship, the fungi colonizes the flower's seeds and provides it with both nutrients and stored photosynthates from other mycorrhizal associations. In return, when mature, the orchid provides the fungi with photosynthates.

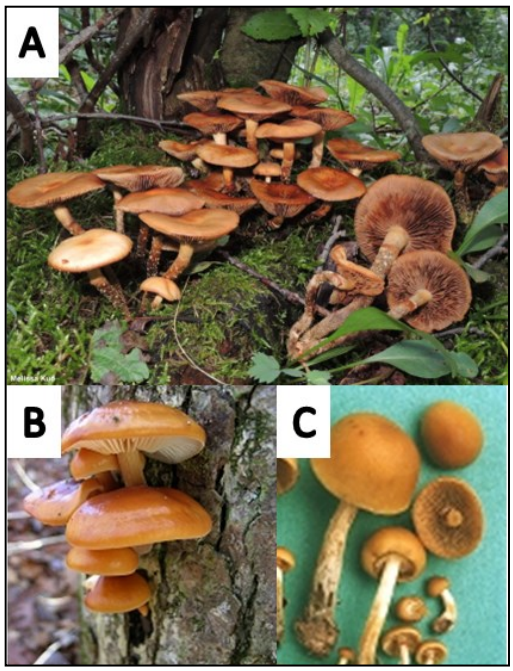
Pink lady slipper bloom. Photo credit: FPR Staff.

Foraging For Fungi

Jelly tree ear (*Auricularia americana*) is a springtime edible that is saprotrophic and found on decaying hardwood species. This fungus has a wavy and irregular (ear-like) shape that is 2-5cm across and thin. The fruiting body is attached to the decaying substrate at a central position but lacks a traditional stem. The upper spore-bearing surface is brown to reddish-brown and is sometimes wrinkled. It has a white spore print. The lower surface is finely hairy when young which gives the surface a whitish hue but matures to a brown to reddish-brown color. The entire fruiting body is gelatinous. This mushroom has an edible look a like the amber jelly roll (*Exidia recisa*), which is more common later in the growing season. This mushroom is also saprotrophic and can be found growing out of decaying hardwood species, especially oaks. This mushroom is a cluster of individual fruiting bodies, each being a lobed mass that is 1-4cm across. This mushroom also lacks a traditional stem and is attached to the substrate at a somewhat centrally located position. The upper spore-bearing surface is dark brown to purple and has concave depressions and ridges. It has a white spore print and its lower surface is dull brown.



A: Jelly tree ear. Photo credit: Michael Kuo, MushroomExpert. **B:** Amber jelly roll. Photo Credit: Michael Kuo, MushroomExpert.



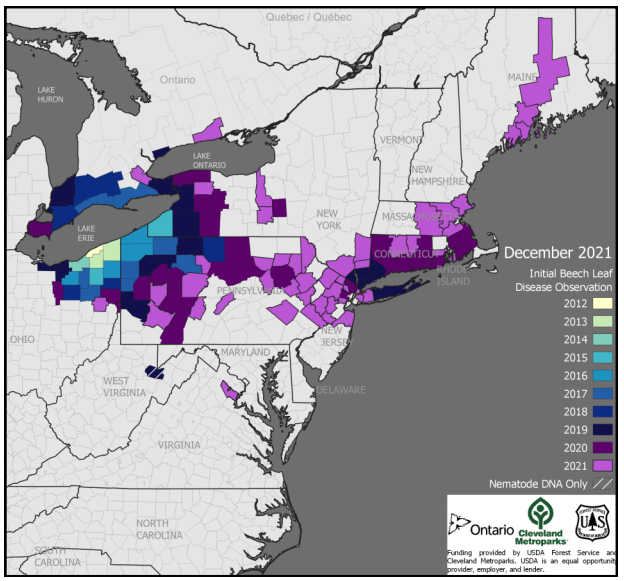
A: Sheathed woodtuft. Photo credit: Michael Kuo, MushroomExpert. **B:** Enoki. Photo credit: Michael Kuo, MushroomExpert. **C:** Funeral bells. Photo Credit: Richard Nadon, MushroomExpert.

Sheathed woodtuft (*Kuehneromyces mutabilis*) is an edible mushroom that can be found throughout the growing season. This fungus is saprotrophic and is found growing in clusters out of hard and softwood species. Its cap is convex and matures to broadly convex to flat and is 3-5.5cm wide. The cap is either bald or has scattered whitish to yellow fibrils and is tawny to orangish brown, changing to yellow-brown when dried. The underside of the cap has pale tan to cinnamon brown gills, that are covered with a partial veil when immature. It has a cinnamon brown spore print. Its stem is 5-9cm long and up to 1cm thick, with a whitish ring. The stem is whitish and is covered with small, whitish to brownish scales that begin from the base up. This mushroom can be confused with the edible, enoki (*Flammulina velutipes*), and poisonous funeral bell (*Galerina marginata*). For more information on these look a likes, check out March's Forest Health Insect and Disease Observation Report. As with all wild mushrooms, there are risks to eating and misidentifying them which can be both dangerous and fatal. Always ensure you have the correct identification before consuming any wild edible. ***The State of Vermont accepts no liability or responsibility for the consumption and/or misidentification of any mushrooms mentioned in this publication.***

Pests in the Spotlight: Beech Leaf Disease

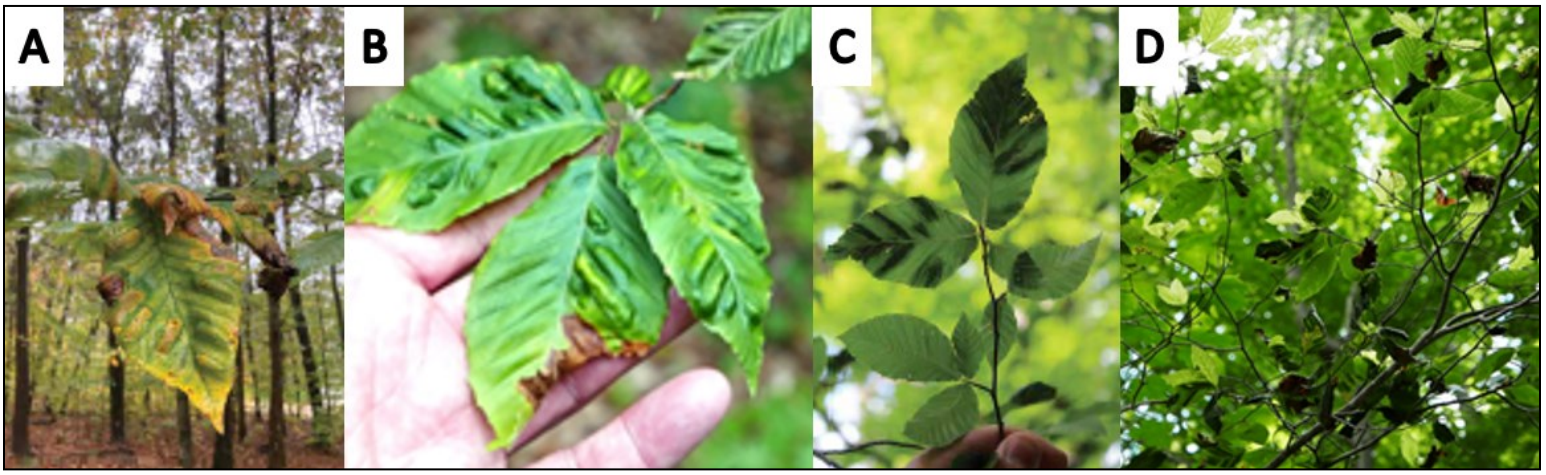
Beech leaf disease (BLD) affects American (*Fagus grandifolia*), European *(F. sylvatica*), Oriental (*F. orientalis*), and Chinese (*F. engleriana*) beech species, and causes leaf deformation, dieback, and mortality of infested hosts. The causal agent of BLD is an introduced nematode from Japan, *Litylenchus crenatae mccannii*. This pest was first documented in Ohio in 2012 and has currently **not been observed in Vermont.** This pest can affect all ages and sizes of beech, and is found in association with buds and leaves.

This pest has currently been reported in 9 states, and Ontario Canada. The most recent reports are in Maine (2021), Massachusetts (2020) and Rhode Island (2020).



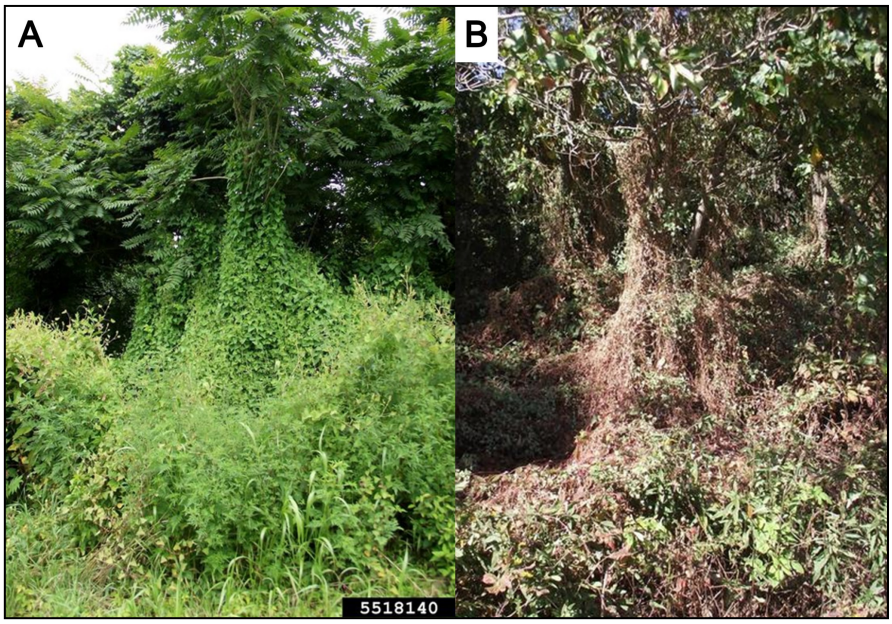
Current known range of BLD. Map and data: Cleveland Metroparks.

In early stages of infection, beech leaves begin to develop a thick striping pattern between leaf veins, which can sometimes coincide with chlorosis (yellowing). In severe infections, the striping area has been observed as slightly raised and thicker than normal tissue, which will lead to leaf deformation. Heavily symptomatic leaves may drop mid-growing season, however less symptomatic leaves typically do not drop. Overtime, dieback will occur which starts at the lower branches on a canopy and progresses upwards. In younger trees, disease progression can be rapid which leads to high mortality of saplings and understory beech. Studies have shown that symptoms do not progress throughout the growing season, which provides support for nematodes overwintering inside of buds and affecting leaves before budbreak in the spring. Due to this, symptoms can include aborted buds which present as crispy empty buds on an affected branch. For more information or to report a sighting, visit VTinvasives.



A: Advanced symptoms of BLD. Photo credit: Cameron McIntire, USDA FS. **B:** Moderate symptoms of BLD. Photo credit: Jim Chatfield, Ohio State University. **C:** Banding symptom associated with BLD. Photo credit: Tom Macy, Ohio DNR. **D:** Leaf drop and dieback. Photo credit: Jim Chatfield, Ohio State University.

Early Detection: Mile-A-Minute Vine



Persicaria perfoliata infestations during (A) and after (B) growing season. Photo Credits: Richard Gardner, Bugwood.

While it can seem like the grass in our yards can grow six inches in a day, there is an invasive vine that can actually grow that quickly. Mile-a-minute vine (*Persicaria perfoliata* syn. *Polygonum perfoliatum*), also called mile-a-minute weed, Asiatic smartweed, Asiatic tearthumb, giant climbing tearthumb, or devil's tail/tearthumb, is an herbaceous, barbed annual vine that grows up to six inches per day, forming dense mats that can smother other understory vegetation and can also grow up and smother trees.

Mile-a-minute vine evolved in Asia, from as far west as Turkey, as far south as Papua New Guinea, and as far east as Japan. Documented introductions to North America have occurred several times, in the 1890s in Oregon, and the late 1930s in Maryland, but the east coast population was established from an accidental introduction in the 1930s at a nursery in York County, Pennsylvania in contaminated product. For the first several decades, the population of mile-a-minute vine only spread across Pennsylvania and Maryland, but by the early 2000s, was documented in over half a dozen states, and currently is found in southern New England, mid-Atlantic, and is starting to pop up in places further west.

The smartweed family has more than 20 species present in New England, and over a dozen of those are present in Vermont. Mile-a-minute vine is one of the smartweed species that is ***currently absent*** from Vermont. The vine prefers damp soils but can grow in dry soils as well, and adventitiously grows in human-disturbed areas. It can grow in forest edges and margins, meadows and fields, riparian areas, wetlands, and human-impacted areas like roadsides and railways. Spread is thought to be largely driven by wildlife like birds, which eat the fruit and can carry the undigested achenes long distances away from infestations, but also by water, as the seeds can remain buoyant for over a week.

Impacts of this vine include smothering and outcompeting locally evolved vegetation, which is everything from ground vegetation to trees, local economics as it's a known major pest for reforestation efforts, young forests, landscape nurseries, tree plantations, orchards, and utility rights-of-ways, and can also impede recreation and wildlife movement because the leaves, petioles, and stems are covered in those sharp barbs. Though in its evolved range the plant is used for herbal medicine and has potential as a source of chemicals that could aid in-crop weed control, the documented detrimental impacts and the continued escape and spread throughout New England are reasons it's listed as an early detection invasive species on Vermont's unofficial watchlist, and why it has a New York invasiveness ranking of "very high".

There are no confirmed locations of this plant in Vermont, so if found, please report them using the Report It! Tool on the VTinvasives.org website.

What is concerning about the potential spread of this plant, and why it's considered to have serious invasive potential are that mile-a-minute vine:

- doesn't require pollinators to successfully reproduce sexually (produce viable seeds).
- can produce seed across much of the growing season (in warmer places it's invaded, June thru October).
- seeds remain viable in the soil for 3-5 years, though germination rates decrease, and those seeds overwinter successfully in the soil.
- seeds usually require an 8-week cold period (vernalization), which makes areas north of the current infestation prime for establishment, and it could potentially exhibit a perennial life cycle in warmer parts of the US because it occurs in sub-tropical areas in its evolved range.

While there are many small, green herbaceous plants in Vermont, like halberd-leaved smartweed, there are a few key characteristics to look for to distinguish the invasive mile-a-minute vine:

- Leaves
  - Alternate, pale green, ***shaped like equilateral triangles***, lower leaf surface has downward curving barbs.

- Stem
  - ***Is a vine***, and the stems are green and delicate looking, turning to red and woody with age, and have downward curving barbs which also harden with age.

- Flowers and Fruit
  - Flowers are small and white, on racemes, turning to ***purple and blue berry-like fruits***.

- Other Characteristics
  - ***Has ocreae*** (a structure formed of stipules fused into a sheath surrounding the stem) at the nodes, that are cupped and look leafy, and are where the flowers and fruit form.
  - Are shallowly rooted, with small, fibrous roots.
  - Has downward curving barbs on the leaves, petioles, and stems.

Persicaria perfoliata fruit, ocreae, leaves, and barbed stems. Photo Credit: Leslie J. Mehrhoff, University of Connecticut, Bugwood.

To learn more about invasive mile-a-minute vine, check out VTinvasives.org and these additional resources:

New Hampshire Agency of Agriculture
Michigan Invasive Species Program
Plants of the World Online
eFloras.org Flora of North America
GoBotany – Native Plant Trust
New York Invasive Species Information
Invasive.org
Centre for Agriculture and Bioscience International
USDA Forest Service
Global Invasive Species Database – Invasive

Distribution-
EDDMapS – Persicaria perfoliata
iNaturalist – Persicaria perfoliata

Persicaria perfoliata foliage, displaying the equilateral triangle-shaped leaves. Photo Credit: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Invasive Plant Phenology

In the second full week of each month, volunteers report invasive plant phenology from around the state. Their observations are compiled here, creating both a timely resource for best management options and a historic record of plant behavior. If you would like to be involved in this effort, please contact pauline.swislocki@vermont.gov. Observations are still needed in multiple counties.

Caledonia – Breaking leaf bud: Asiatic bittersweet, common buckthorn, glossy buckthorn, Japanese barberry; Leaves: common buckthorn, glossy buckthorn, shrub honeysuckles, Japanese barberry, knotweed; Increasing leaf size: common buckthorn, glossy buckthorn, shrub honeysuckles, Phragmites, Japanese barberry, knotweed

Chittenden – Initial growth: knotweed; Leaves: common buckthorn, common burdock, goutweed, shrub honeysuckles, knotweed, multiflora rose, wild parsnip; Increasing leaf size: common buckthorn, common burdock, goutweed, knotweed, shrub honeysuckles, multiflora rose, wild parsnip; Flower buds/ flower heads: garlic mustard, shrub honeysuckles; Open flowers: garlic mustard, greater celandine, vinca

Orange – Leaves: burning bush, common barberry, shrub honeysuckles; Increasing leaf size: burning bush, common barberry, shrub honeysuckles

For more information about the phenology of invasive plants in Vermont, check out Bud Buds, a podcast from the Invasive Plant Program.

FORESTS, PARKS & RECREATION VERMONT
AGENCY OF NATURAL RESOURCES

For more information, contact the Forest Biology Laboratory at 802-505-8259 or:

Windsor & Windham Counties	Springfield (802) 289-0613
Bennington & Rutland Counties	Rutland (802) 786-0060
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Lamoille, Orange & Washington Counties	Barre (802) 476-0170
Caledonia, Orleans & Essex Counties	St. Johnsbury (802) 751-0110

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